

## REMARKS

Claims 1-71 are pending in the application and are presented for reconsideration.

Claims 1, 3, 5, 7, 9 and 64 were rejected under 35 USC 102(b) as being anticipated by Vriens, *et al.* (U.S. Pat. No. 5,813,753). This rejection is respectfully traversed.

The claimed semiconductor light-emitting device includes a semiconductor light-emitting element that produces outgoing light with an emission wavelength of 390-420 nm and includes a fluorescent substance excited by the outgoing light to emit visible light with a specific range emission peak. For example, claim 1 recites a semiconductor light-emitting element that produces outgoing light having an emission wavelength of 390-420 nm and includes a fluorescent substance excited by the outgoing light that emits red light having an emission wavelength with its main emission peak in a wavelength range of 600-670 nm.

Such a device can provide monochromatic visible light, red light, with a good color tone. In comparison, conventional devices fail to provide such monochromatic visible light with a good color tone because outgoing light from a semiconductor light-emitting element and visible light emitted from a fluorescent substrate are mixed, as described in paragraph [0012] of the specification. In the device of claim 1, first, visible light with its main emission peak in a wavelength range of 600-670 nm is chosen as a emission light of the device visible to humans because emission in this range from the fluorescent substance can produce monochromatic red light. Then, an emission wavelength of 390-420 nm is chosen as the wavelength of the exciting source because light in this wavelength range is not visible to humans. See paragraph [0016] of the specification. As a result, even though the exciting light in the wavelength range of 390-420 nm is mixed with the monochromatic emission light of the device in the wavelength range of 600-670 nm, the good color tone of the monochromatic emission light is preserved because human eyes can only recognize the monochromatic emission light of the device.

Vriens, in contrast, is directed to a UV/blue LED-phosphor device with reflective sidewalls. Although Vriens does disclose using a UV/blue LED, Vriens does not disclose the specific light-emitting range of the semiconductor element claimed or the emission peak of monochromatic light emitted from the fluorescent substance as specifically claimed. Vriens' device is directed to improving its energy efficiency and resorts to other means than choice of

wavelength, such as filters, to prevent the exciting light from reaching to human eyes. See column 5, lines 12-16.

Applicants submit that Vriens fails to teach or suggest each and every feature of the claimed invention. Specifically, Vriens fails to teach or suggest the specific range claimed for the light-emitting element and the range claimed for the fluorescent substance. Claim 1, for example, recites a light-emitting element having outgoing light in the emission wavelength of 390-420 nm. While Vriens does mention the benefits of a light-emitting element with an emission wavelength above 390 nm, Vriens does not mention or even recognize limiting that range to an upper end of 420 nm. This is a significant limitation of claim 1 because light with longer wavelengths than 420 nm is visible to humans and degrades the color tone of the monochromatic light from the fluorescent substance. See page 9, line 24 - page 10, line 7. Vriens does not have to rely on limiting the wavelength range of the exciting light because the filters are supposed to prevent the exciting light from leaking out of the device. Accordingly, there is no motivation, in Vriens, to limit the upper end of the wavelength range of the exciting light. Vriens also does not teach or suggest the specific emission peak range of the fluorescent substance. As explained in the specification, use of a fluorescent substance with an emission peak in any of the wavelength ranges claimed results in a monochrome color emission with a good color tone. Accordingly, applicants respectfully request the withdrawal of the rejection of claims 1, 3, 5, 7, 9 and 64 under 35 USC 102(b) in view of Vriens.

Claims 2, 4, 6, 8 and 65-71 were rejected under 35 USC 103(a) as being unpatentable over Vriens and further in view of the Phosphor Handbook. This rejection is respectfully traversed.

The Phosphor Handbook deals with the luminescence color and peak wavelength of various phosphors. As stated above, Vriens fails to teach or suggest the specific outgoing light emission wavelength or the specific main emission peak of the monochromatic light of the fluorescent substance. The addition of the Phosphor Handbook to the teachings of Vriens does not remedy the deficiencies of Vriens alone. The Phosphor Handbook does not teach how or whether to choose specific emission wavelengths of the outgoing light or the choice of the main emission peak wavelength range as claimed. Neither Vriens nor the Phosphor Handbook would

have suggest or motivated one of ordinary skill in the art to choose the specific wavelengths claimed.

Furthermore, may of the compounds recited in claims 2, 4, 6, 8 and 65-71 are not disclosed in Table 10 of the Phosphor Handbook relied upon by the Examiner. For example, the following compounds are not listed in the Table:  $\text{La}_2\text{O}_2\text{S}$ : Eu,  $\text{Gd}_2\text{O}_2\text{S}$ : Eu and  $\text{Y}_2\text{O}_2\text{S}$ : Eu (claim 2),  $\text{ZnS}$ ,  $\text{SrAl}_2\text{O}_4$ : Eu Dy,  $\text{ZnO}:\text{Zn}$  and  $\text{Zn}_2\text{Ge}_2\text{O}_4$ : Mn (claim 4),  $\text{ZnS}$ : Ag,  $\text{Ca}_{10}(\text{PO}_4)_6\text{F}_2$ : Sb and  $\text{CaAl}_2\text{O}_4$ : En, Nd (claim 6), and  $\text{Sr}_2\text{Si}_3\text{O}_8 \cdot 2\text{SrCl}_2$ : Eu (claim 8). Claims 65-71 recite many of the forgoing compounds. The Phosphor Handbook or Vriens does not teach or suggest such compounds at all.

Accordingly, applicants respectfully request the withdrawal of the rejection of claims 2, 4, 6, 8 and 65-71 under 35 USC 103(a) in view of Vriens and the Phosphor Handbook.

Claim 10 was rejected under 35 USC 103(a) as being unpatentable over Vriens in view of Vecht, *et al.* (U.S. Patent No. 6,379,585). This rejection is respectfully traversed.

Vecht is directed to the preparation of sulphides and selenides. As stated above, Vriens fails to teach or suggest the specific light-emitting element claimed and the specific fluorescent substance with the claimed monochromatic main emission peak. The addition of Vecht fails to teach or suggest the deficiencies in Vriens with regard to the specific light-emitting element claimed and fluorescent substance claimed. Furthermore, there is no motivation in either reference to select a specific phosphorous claimed or the claimed emission wavelength ranges. Accordingly, applicants respectfully request the withdrawal of the rejection of claim 10 under 35 USC 103(a) in view of Vriens and Vecht.

Claims 11-63 were rejected under 35 USC 102(b) as being anticipated by Vriens and in the alternative, under 35 USC 103(a) as obvious over Vriens in view of Komoto, *et al.* (U.S. Patent No. 6,340,824). These rejections are respectfully traversed.

As stated above, Vriens fails to teach or suggest each and every feature claimed. The addition of Komoto fails to remedy the deficiencies of Vriens with regard to the specific light-emitting element emission wavelength claimed and the fluorescent substance main emission peak wavelength range claimed. Furthermore, there is no teaching or suggestion in either reference that would have motivated one of ordinary skill to choose the specifics of the claimed invention. Accordingly, applicants respectfully request the withdrawal of the rejection of claims 11-63

under 35 USC 102(b) in view of Vriens and under 35 USC 103(a) in view of Vriens and Komoto.

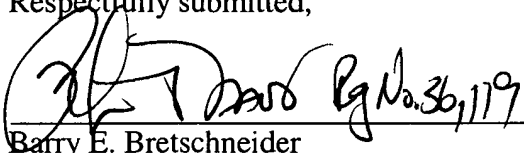
Applicants submit that all pending claims are in condition for allowance, which action is solicited.

In the event that the transmittal letter is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief is required, applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket number 204552021500.

Respectfully submitted,

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By:

  
Barry E. Bretschneider  
Registration No. 28,055

Morrison & Foerster LLP  
1650 Tysons Boulevard, Suite 300  
McLean, VA 22102-3915  
Telephone: (703) 760-7743  
Facsimile: (703) 760-7777